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MINTZ, LEVIN, COHN, FERRIS, GLOVSKY & POPEO, P.C.
9255 TOWNE CENTER DRIVE
SUITE 600
SAN DIEGO, CA 92121

EXAMINER	
ADAMS, CHARLES D	
ART UNIT	**PAPER NUMBER**
2164	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	03/23/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/816,011	RADESTOCK ET AL.	
	Examiner	Art Unit	
	Charles D. Adams	2164	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *14 December 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-3,5-9,11-15 and 17-23* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-3,5-9,11-15,17-23* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Remarks

1. In response to communications filed on 14 December 2006, claims 1, 6-9, 13-14, and 18 are amended, claims 4, 10, and 16 are cancelled, and claims 19-23 are added per applicant's request. Claims 1-3, 5-9, 11-15, and 17-23 are pending in the application.

Claim Rejections - 35 USC § 101

2. 35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

3. Claims 22 and 23 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

The claimed subject matter lacks a useful and tangible result.

Though the claims use a generated weighted subset estimate (or an estimate) of the number of results from a query to determine whether or not to execute on a data repository, there is ultimately nothing being done with this determination. No execution on a data repository is occurring. Therefore, the claims lack a useful result. In addition to this, there is no tangible result of the claimed subject matter. No output is being sent to a user and no physical change is occurring.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

5. Claims 6, 19-20, and 22 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

In the interview, the Examiner indicated the limitation that "*F* is a real number" was probably acceptable. Upon further review of the specification, no recitation of *F* being a real number, or any certain class of number, can be found. Therefore, the definitions of *F* as a real number and of *F* as a natural number raise an issue of new matter.

Examiner notes that, in the specification, *F* is defined as clearly as "a safety factor". Paragraph [0032] of the current application states:

> F, the safety factor, is an arbitrary number and may be configured in a user interface. F may be used to compensate for the fact that data might not be evenly distributed in a data repository. F need not be completely arbitrary, and may, for example, be based on tests of different values for F.

Examiner maintains the position that "an arbitrary number" is indefinite. In light of this, Examiner recommends defining F as "a safety factor" or "a user defined number", as both are clearly supported by the specification.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

7. Claims 1-3, 5, 9, 11-12, 14-15, 17 are rejected under 35 U.S.C. 102(e) as being anticipated by Gharachorloo et al. (US Patent 7,174,346).

As to claim 1, Gharachorloo et al. teaches:

Receiving a query for execution on data in the data repository (see 10:16-31);

Generating an estimate of a number of results of the query (see 11:54-58);

Defining a subset of data in the data repository (see 11:30-45);

Determining whether to execute the query on the subset of the data, the query to be executed on the subset of the data if the estimate of the number of results of the query indicates that executing the query on the subset of the data is estimated to return a number of results greater than a threshold number (see 11:30-58 and 12:5-13);

If the query is to be executed on the subset of the data, executing the query on the subset of the data to generate a partial set of results, otherwise executing the query on the data repository to generate a complete set of results (see 11:30-45); and

Providing query results (see 12:32-53).

As to claim 2, Gharachorloo et al. teaches wherein providing query results comprises making the query results available to an application program (see 12:32-53).

As to claim 3, Gharachorloo et al. teaches the application program providing query results to a user interface (see 12:32-53).

As to claim 5, Gharachorloo et al. teaches wherein determining whether to execute the query on the subset of the data comprises estimating whether executing the query on the subset of the data would generate a desired number of results, the method comprising:

Receiving a value representing the desired number of results (see 7:32-37. The method receives the value from memory).

As to claim 9, Gharachorloo et al. teaches:

A data repository, wherein the data repository is configured to store data (see 3:27-43 and 6:17-31); and

One or more processes for executing queries on the data repository (see 3:27-43), wherein the one or more processes are operative to:

Receive a query for execution on data in the data repository (see 10:16-31);

Generate an estimate of a number of results of the query (see 11:54-58);

Define a subset of data in the data repository (see 11:30-45);

Determine whether to execute the query on the subset of the data, the query to be executed on the subset of the data if the estimate of the number of results of the query indicates that executing the query on the subset of the data is estimated to return a number of results greater than a threshold number (see 11:30-58 and 12:5-13);

If the query is to be executed on the subset of the data, execute the query on the subset of the data to generate a partial set of results, otherwise execute the query on the data repository to generate a complete set of results (see 11:30-45); and

Provide query results (see 12:32-53).

As to claim 11, Gharachorloo et al. teaches:

Wherein the operation of providing query results comprises making the query results available to an application program (see 12:32-53).

As to claim 12, Gharachorloo et al. teaches wherein the operation of determining whether to execute the query on the subset of the data comprises estimating whether executing the query on the subset of the data would generate a desired number of results, the one or more processes are further operative to:

Receive a value representing the desired number of results (see 7:32-37. The method receives the value from memory).

As to claim 14, Gharachorloo et al. teaches:

Receive a query for execution on data in a data repository (see 10:16-31);

Generate an estimate of a number of results of the query (see 11:54-58);

Define a subset of data in the data repository (see 11:30-45);

Determine whether to execute the query on the subset of the data, the query to be executed on the subset of the data if the estimate of the number of results of the query indicates that executing the query on the subset of the data is estimated to return a number of results greater than a threshold number (see 11:30-58 and 12:5-13);

If the query is to be executed on the subset of the data, execute the query on the subset of the data to generate a partial set of results, otherwise execute the qury on the data repository to generate a complete set of results (see 11:30-45); and

Provide query results (see 12:32-53).

As to claim 15, Gharachorloo et al. teaches wherein the operation of providing query results comprises making the query results available to an application program (see 12:32-53).

As to claim 17, Gharachorloo et al. teaches wherein the operation determining whether to execute the query on the subset of the data comprises estimating whether executing the query on the subset of the data would generate a desired number of results, the computer program product further comprising instructions operable to:

Receive a value representing the desired number of results (see 7:32-37. The method receives the value from memory).

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

9. Claims 7, 13, and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gharachorloo et al. (US Patent 7,174,346) in view of Demarcken et al. (US Pre-Grant Publication 2004/0249799).

As to claims 7, 13, and 18, Gharachorloo et al. teaches the claim upon which this claim is dependent.

Gharachorloo et al. does not teach:

In response to executing the query on a previous subset of data, determining whether a sufficient number of results have been generated;

Demarcken et al. teaches:

In response to executing the query on a previous subset of data, determining whether a sufficient number of results have been generated (see paragraph [0079]);

Charachorloo et al. as modified teaches:

If a sufficient number of results have been generated, defining a next subset of the data in the data repository and executing the query on the next subset of the data, otherwise executing the query on the data repository (see Demarcken et al. paragraph [0079]).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified Gharachorloo et al. by the teaching of Demarcken et al., since Demarcken et al. teaches that "aspects of this invention enable query caching to be a valuable and effective tool for reducing computational load" (see paragraph [0014]).

10. Claims 6, 19-20, and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gharachorloo et al. (US Patent 7,174,346) in view of Carey et al. (US Patent 5,956,706).

As to claim 6, Gharachorloo et al. teaches wherein:

The method further comprises receiving a value representing a desired number of results (see 11:30-58 and 12:5-13);

The query is to be executed on the subset of the data if the estimate of the number of results of the query is greater than a weighted subset estimate generated (see 11:30-58 and 12:5-13)

Gharachorloo et al. does not explicitly teach generated in accordance with the following estimation function:

$R^{*}\frac{N}{StripeSize} * F$, where R is the number of results desired (see Carey et al. 7:5-27, *$cost_p$(ALL) is a number of results desired*), N is the total number of possible results (*N is all the tuples of the first set of tuples)*, F is a real number (*$cost_p$ (1)*), and stripeSize

is the size of the subset of the data (*ALL is a size of the stripe of data)* (see Carey et al. 7:5-27); and

Gharachorloo et al. as modified teaches:

determining whether to execute the query on the subset of data comprises:

generating the weighted subset estimate (see Carey et al. 7:5-27) ; and

determining whether the estimate of the number of results of the query is greater than the weighted subset estimate (see Gharachorloo et al. 11:30-58 and 12:5-13).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified Gharachorloo et al. by the teaching of Carey et al., since Carey et al. teaches that "in other words, it is desirable that the specification of a cardinality limit in SQL require at most minimal or no changes to other operations of a database management system" (see 2:61-64).

As to claim 19, Gharachorloo et al. teaches wherein F is a natural number (see 7:31-35. The ($cost_p$ *(1)*) is approximately equal to zero).

As to claim 20, Gharachorloo et al. teaches wherein:

Generate a weighted subset estimate of performing a query on a data repository(see 11:30-58 and 12:5-13)

Gharachorloo et al. does not explicitly teach generated in accordance with the following estimation function:

$R^* \frac{N}{StripeSize} * F$, where R is the number of results desired (see Carey et al. 7:5-27, *$cost_p$(ALL) is a number of results desired*), N is the total number of possible results (*N is all the tuples of the first set of tuples)*, F is a real number (*$cost_p$ (1)*), and stripeSize is the size of the subset of the data (*ALL is a size of the stripe of data)* (see Carey et al. 7:5-27); and

Gharachorloo et al. as modified teaches:

Determine to execute the query on a subset of data in the data repository if the weighted subset estimate is greater than an estimate of the number of results of the query (see Carey et al. 7:5-27 and Gharachorloo et al. 11:30-58 and 12:5-13); and

Determine to execute the query on the data repository if the estimate of the number of results of the query is greater than the weighted subset estimate (see Carey et al. 7:5-27 and Gharachorloo et al. 11:30-58 and 12:5-13).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified Gharachorloo et al. by the teaching of Carey et al., since Carey et al. teaches that "in other words, it is desirable that the specification of a cardinality limit in SQL require at most minimal or no changes to other operations of a database management system" (see 2:61-64).

As to claim 23, Gharachorloo et al. teaches wherein:

Generate a weighted subset estimate of performing a query on a data repository(see 11:30-58 and 12:5-13)

Gharachorloo et al. does not explicitly teach generated in accordance with the following estimation function:

$R^{*}\frac{N}{StripeSize} * F$, where R is the number of results desired (see Carey et al. 7:5-27, *$cost_p$(ALL) is a number of results desired*), N is the total number of possible results (*N is all the tuples of the first set of tuples)*, F is a real number (*$cost_p$ (1)*), and stripeSize is the size of the subset of the data (*ALL is a size of the stripe of data)* (see Carey et al. 7:5-27); and

Gharachorloo et al. as modified teaches:

Determine to execute the query on a subset of data in the data repository if the weighted subset estimate is greater than an estimate of the number of results of the query (see Carey et al. 7:5-27 and Gharachorloo et al. 11:30-58 and 12:5-13); and

Determine to execute the query on the data repository if the estimate of the number of results of the query is greater than the weighted subset estimate (see Carey et al. 7:5-27 and Gharachorloo et al. 11:30-58 and 12:5-13).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified Gharachorloo et al. by the teaching of Carey et al., since Carey et al. teaches that "in other words, it is desirable that the specification of a cardinality limit in SQL require at most minimal or no changes to other operations of a database management system" (see 2:61-64).

11. Claims 8, 20, and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gharachorloo et al. (US Patent 7,174,346) in view of Chen et al. ("Selectivity

Estimations for Boolean Queries"), further in view of, Zuzarte (US Patent 7,171,408), and further in view of Keller et al. (US Pre-Grant Publication 2007/0022136).

As to claim 8, Gharachorloo et al. teaches the claim upon which this claim is dependent.

Gharachorloo et al. does not teach wherein generating an estimate of a number of results of the query is generated in accordance with the following estimation functions:

est (NOT) = N – est(op),

Chen et al. teaches wherein generating an estimate of a number of results of the query is generated in accordance with the following estimation functions:

est (NOT) = N – est(op) (see Chen. 3.4.2, the selectivity can be estimated by al the results minus the results containing the operand),

Gharachorloo et al. as modified does not teach:

$$est(AND) = \frac{est(op_1) * est(op_2)}{N}$$

Zuzarte teaches:

$$est(AND) = \frac{est(op_1) * est(op_2)}{N}$$ (see 7:8-14. It is a conventional method)

Gharachorloo et al. as modified does not teach:

$$est(OR) = est(op_1) * est(op_2) - \frac{est(op_1) * est(op_2)}{N}$$

Keller et al. teaches:

$$est(OR) = est(op_1) * est(op_2) - \frac{est(op_1) * est(op_2)}{N}$$ (see paragraphs [0097]-[0100]. To estimate an "OR" query, one adds the first and second operation, and subtracts the value of ANDing both operations together. As an AND is taught above, this would have been obvious to one of ordinary skill in the art).

Gharachorloo et al. as modified teaches

Where op is an operand (see Zuzarte et al. 7:8-14), est() returns an estimate of a number of results matching the operator or operand in the parenthesis (see Zuzarte et al. 7:8-14), and N is the total number of possible results (see Zuzarte et al. 1:54-58, it is already divided over the total number of possible results to produce a percentage).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified Gharachorloo et al. by the teaching of Chen et al., since Chen et al. teaches that "in a variety of applications ranging from optimizing queries on alphanumeric attributes to providing approximate counts of documents containing several query terms, there in an increasing need to quickly and reliably estimate the number of strings (tuples, documents, etc.) matching a Boolean query" (see Abstract).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to further modify Gharachorloo et al. by the teaching of Zuzarte, since Zuzarte teaches that the above method is a conventional method (see 7:8-14), and thus is well known in the art. In addition to this, Keller et al. simply provides basic equations for estimating Boolean cardinality. It would have been obvious to one of

ordinary skill in the art at the time the invention was made to have included another algorithm describing how to calculate the cardinality of a Boolean operator.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified Gharachorloo et al. in view of Keller et al., since Keller et al. teaches that "the result size estimates help with choosing between different access method alternatives for providing an optimum use of resources" (see paragraph [0006]). In addition to this, Keller et al. simply provides basic equations for estimating Boolean cardinality. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have included another algorithm describing how to calculate the cardinality of a Boolean operator.

As to claim 20, Gharachorloo et al. teaches the claim upon which this claim is dependent.

Gharachorloo et al. does not teach wherein generating an estimate of a number of results of the query is generated in accordance with the following estimation functions:

est (NOT) = N – est(op),

Chen et al. teaches wherein generating an estimate of a number of results of the query is generated in accordance with the following estimation functions:

est (NOT) = N – est(op) (see Chen. 3.4.2, the selectivity can be estimated by al the results minus the results containing the operand),

Gharachorloo et al. as modified does not teach:

$$est(AND) = \frac{est(op_1) * est(op_2)}{N}$$

Zuzarte teaches:

$$est(AND) = \frac{est(op_1) * est(op_2)}{N}$$ (see 7:8-14. It is a conventional method)

Gharachorloo et al. as modified does not teach:

$$est(OR) = est(op_1) * est(op_2) - \frac{est(op_1) * est(op_2)}{N}$$

Keller et al. teaches:

$$est(OR) = est(op_1) * est(op_2) - \frac{est(op_1) * est(op_2)}{N}$$ (see paragraphs [0097]-[0100]. To estimate an "OR" query, one adds the first and second operation, and subtracts the value of ANDing both operations together. As an AND is taught above, this would have been obvious to one of ordinary skill in the art).

Gharachorloo et al. as modified teaches

Where op is an operand (see Zuzarte et al. 7:8-14), est() returns an estimate of a number of results matching the operator or operand in the parenthesis (see Zuzarte et al. 7:8-14), and N is the total number of possible results (see Zuzarte et al. 1:54-58, it is already divided over the total number of possible results to produce a percentage).

Determine to execute the query on a subset of data in the data repository if a weighted subset estimate is greater than the estimate of the number of results of the query (see 11:30-58 and 12:5-13); and

Determine to execute the query on the data repository if the estimate of the number of results of the query is greater than the weighted subset estimate (see 11:30-58 and 12:5-13).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified Gharachorloo et al. by the teaching of Chen et al., since Chen et al. teaches that "in a variety of applications ranging from optimizing queries on alphanumeric attributes to providing approximate counts of documents containing several query terms, there in an increasing need to quickly and reliably estimate the number of strings (tuples, documents, etc.) matching a Boolean query" (see Abstract).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to further modify Gharachorloo et al. by the teaching of Zuzarte, since Zuzarte teaches that the above method is a conventional method (see 7:8-14), and thus is well known in the art. In addition to this, Keller et al. simply provides basic equations for estimating Boolean cardinality. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have included another algorithm describing how to calculate the cardinality of a Boolean operator.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified Gharachorloo et al. in view of Keller et al., since Keller et al. teaches that "the result size estimates help with choosing between different access method alternatives for providing an optimum use of resources" (see paragraph [0006]). In addition to this, Keller et al. simply provides basic equations for

estimating Boolean cardinality. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have included another algorithm describing how to calculate the cardinality of a Boolean operator.

As to claim 23, Gharachorloo et al. does not teach wherein generating an estimate of a number of results of the query is generated in accordance with the following estimation functions:

est (NOT) = N – est(op),

Chen et al. teaches wherein generating an estimate of a number of results of the query is generated in accordance with the following estimation functions:

est (NOT) = N – est(op) (see Chen. 3.4.2, the selectivity can be estimated by al the results minus the results containing the operand),

Gharachorloo et al. as modified does not teach:

$$est(AND) = \frac{est(op_1) * est(op_2)}{N}$$

Zuzarte teaches:

$$est(AND) = \frac{est(op_1) * est(op_2)}{N}$$ (see 7:8-14. It is a conventional method)

Gharachorloo et al. as modified does not teach:

$$est(OR) = est(op_1) * est(op_2) - \frac{est(op_1) * est(op_2)}{N}$$

Keller et al. teaches:

$$est(OR) = est(op_1) * est(op_2) - \frac{est(op_1) * est(op_2)}{N}$$ (see paragraphs [0097]-[0100]. To estimate an "OR" query, one adds the first and second operation, and subtracts the value of ANDing both operations together. As an AND is taught above, this would have been obvious to one of ordinary skill in the art).

Gharachorloo et al. as modified teaches

Where op is an operand (see Zuzarte et al. 7:8-14), est() returns an estimate of a number of results matching the operator or operand in the parenthesis (see Zuzarte et al. 7:8-14), and N is the total number of possible results (see Zuzarte et al. 1:54-58, it is already divided over the total number of possible results to produce a percentage).

Determine to execute the query on a subset of data in the data repository if a weighted subset estimate is greater than the estimate of the number of results of the query (see 11:30-58 and 12:5-13); and

Determine to execute the query on the data repository if the estimate of the number of results of the query is greater than the weighted subset estimate (see 11:30-58 and 12:5-13).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified Gharachorloo et al. by the teaching of Chen et al., since Chen et al. teaches that "in a variety of applications ranging from optimizing queries on alphanumeric attributes to providing approximate counts of documents containing several query terms, there in an increasing need to quickly and reliably estimate the number of strings (tuples, documents, etc.) matching a Boolean query" (see Abstract).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to further modify Gharachorloo et al. by the teaching of Zuzarte, since Zuzarte teaches that the above method is a conventional method (see 7:8-14), and thus is well known in the art. In addition to this, Keller et al. simply provides basic equations for estimating Boolean cardinality. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have included another algorithm describing how to calculate the cardinality of a Boolean operator.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified Gharachorloo et al. in view of Keller et al., since Keller et al. teaches that "the result size estimates help with choosing between different access method alternatives for providing an optimum use of resources" (see paragraph [0006]). In addition to this, Keller et al. simply provides basic equations for estimating Boolean cardinality. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have included another algorithm describing how to calculate the cardinality of a Boolean operator.

Response to Arguments

12. Applicant's arguments with respect to claims 1-3, 5-9, 11-15, and 17-18 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

13. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Charles D. Adams whose telephone number is (571) 272-3938. The examiner can normally be reached on 8:30 AM - 5:00 PM, M - F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Charles Rones can be reached on (571) 272-4085. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Charles Adams
AU2164

Primary Examiner
Cain Y Truong